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(54) Title: TUNABLE LASER TRANSMITTER WITH INTERNAL WAVELENGTH GRID GENERATORS

## (57) Abstract

The present invention provides a continuously tunable external cavity laser ECL with a compact form factor and precise tuning to a selected center wavelength of a selected wavelength grid. The ECL may thus be utilized in telecom applications to generate the center wavelengths for any channel on the ITU or other optical grid. The ECL does not require a closed loop feedback. A novel tuning mechanism is disclosed which provides for electrical or mechanical tuning to a known position or electrical parameter, e.g., voltage, current, or capacitance, with the required precision in the selected center wavelength arising as a result of a novel arrangement of a grid

generator (226) and a channel selector (262). The grid generator (226) exhibits first pass bands which correspond to the spacing between the individual channels of the selected wavelength grid and a finesse which suppresses side band modes of the laser. The channel selector (262) exhibits second pass bands that are wider than the first pass bands. In an embodiment of the invention the second pass bands have a periodicity substantially corresponding with the separation between the shortest wavelength channel and the longest wavelength channel of the selected wavelength grid and a finesse which suppresses channels adjacent to the selected channel. The broad second pass bands of the channel selector reduce the sensitivity of the ECL to tuning variations about the selected channel, thus avoiding the requirement of a closed loop feedback system to control the channel selector (262).

